



The Vertical Piccolo

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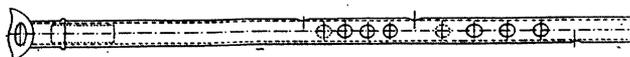
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The Vertical Piccolo

This article explores patents and existing instruments that allowed the piccolo to be played vertically. Much of this information has not been presented in detail, prior to this study. Giorgi, previously known for his patent and application of a vertical mouth-piece to the flute was not the first maker to attempt this innovation. From the consultation of patents it will be proved that the innovation by Giorgi was in fact ten years later than the first patent by a little known Italian Camillo Bergonzoni. Mistaken assumptions, previously documented have been corrected.

In the nineteenth century, various inventors patented ideas to enable the flute to be played vertically, (vertically held, transversely blown) some of which were applied to the piccolo. The most famous of these inventors was Carlo Tommaso Giorgi (b.1856 d.1953).¹

On March 24th 1896, whilst a Professor of Flute at the Royal Academy of Florence, Giorgi applied for a patent for his new system. According to the application for the patent no.6515, he had become interested in devising a flute that could play all the chromatic notes without keys or cross-fingerings and accordingly created a system using the fingers and thumbs of both hands and the side of the first finger of the left hand to cover the eleven chromatic holes.



Specification Drawing from Giorgi's Patent no. 6515

He moved the lip-plate to the extremity of the head as in a 'T' formation so that the flute could be held vertically instead of transversely. Giorgi says of his headpiece 'the mouth-piece is, as in other flutes on the lateral side... [and] has the hole not in the centre of the pipe but on the side to preserve the characteristic voice of the flute.'² The mouthpiece has the chin to rest against and there is no cork required to close the top end of the flute.

'The mouth piece is ...disposed for blowing directly instead of transversely to avoid the dispersion of wind and so that the harmonics of the 12th are got in perfect intonation.'³

¹ L. de Lorenzo: *My Complete Story of the Flute* (USA: Texas Tech University Press, 1992), p.A3.

² From the patent specification.

³ From the patent specification.

'In the transversal flute [however] the air blown from the lips beats against the interior part of the pipe, from there it is reflected towards the cork which stops the pipe, then reflected again along the pipe, so that it produces dispersion of its force which renders the harmonic flat.'⁴



PLAYING POSITION.

SILVER MEDAL, awarded at Scientific and Industrial Exhibition, Coitbridge, 1899.

ADVANTAGES OF THE GIORGI FLUTE:

Both Lungs free from Pressure.
 Much Fuller in tone than Transverse Flutes.
 Most Simple Fingering. No Cross Fingering.
 Chromatic Passages Performed with ease.

It does all that Flutes costing £20 to £40 (with their complicated mechanism) do.

The British Bandsman, Sept., 1898, says: "The greatest triumph, in my opinion, is the Flute with the old fingering and Giorgi head.

"These instruments are sweeter in tone and more perfectly in tune than any flutes of that class that ever came under my notice, and the adoption of them by drum and fife bands cannot fail to create a greater respect for these combinations."

*Advertisement showing Giorgi playing his patented flute*⁵

Fitzgibbon in his text *The Story of the Flute* (1928) suggests that Giorgi was not the first person to think of playing the flute vertically. He lists Charles G. Townley, who in 1808 'devised a mouthpiece to be attached to the end of the flute so as to enable it to be held straight downwards'⁶ and adds 'W. Wheatstone (1820) patented a similar mouthpiece.'⁷ However from the illustrations below, clearly Fitzgibbon was mistaken. In fact the mistake is so apparent that one must speculate as to whether Fitzgibbon had seen either mouthpiece.

Charles Gostling Townley applied on 26th November 1808 for a patent for his improvements to the flute. 'My improvement of the flute mouthpiece is very simple in its nature... The opposite edge of the flute mouthpiece must be considered in the same point of view or nearly so as the wind cutter of a flageolet; and therefore like other wind cutters, it must have the wind conveyed against its edge through a corresponding aperture or throat. By this I mean that if the mouth hole be circular the wind must be conveyed through a crescent of a corresponding circle or oval or through a circular parallel aperture.'⁸

In the patent, Townley does not mention holding the flute vertically, but using an outside tube to direct the air down into the flute. Rockstro states that Townley's mouthpiece is an attachment for the flute 'for the

⁴ From the patent specification.

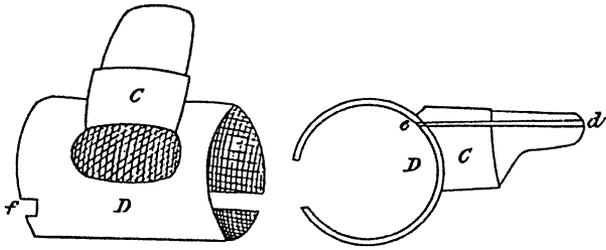
⁵ Advertisement provided by Tony Bingham UK

⁶ Fitzgibbon: *The Flute* (London: W. Reeves, 1928), p.256.

⁷ *Ibid.*, p.256.

⁸ From the patent specification.

purpose of converting it into a whistle.⁹ It did not become popular.



Drawings from Townley's Patent application no.3182 26th November 1808

A plug goes into a brass tube C of the spring cylindrical head D. The apparatus is steadied by the notch f, which has a pin screwed into the flute smaller than the notch, that the mouthpiece may move for the upper and lower notes. The wind is conveyed against the edge of the mouth hole in the direction d, e.



Wheatstone's mouthpiece from Rockstro c.1820

- AA. Curved plate for fitting on to the head-joint.
- B. (Indistinct in the drawing, but just below C) Curved spring-plate for holding the mouth-piece.
- C. Ivory mouth-piece with curved aperture for the passage of the breath.

W. Wheatstone's mouthpiece is not listed in the *Patents for Inventions abridgements of specifications relating to music and musical instruments*.¹⁰ However, Rockstro confirms the invention of W. Wheatstone giving the

⁹ R.S Rockstro: *The Flute* (London: Musica Rara, 2nd Edition 1928, Reprint 1967), p.273.

¹⁰ *Patents for Inventions. Abridgements of Specifications relating to Music and Musical Instruments A.D 1694-1866.* (London: George E. Eyre and William Spottiswoode, 1871. Reprinted Bingham 1990).

date 1820 and provides the drawing reproduced above.¹¹ Rockstro says that 'the tone produced by the aid of this apparatus is poor and unequal...[It] is a slight improvement on Townley's contrivance.'¹²

From the illustration, it can be seen that Wheatstone's mouthpiece is an attachment designed to direct the air into the flute's mouth hole. It does not have any resemblance to Giorgi's design and is clearly an extra attachment added to the original headjoint. The mouthpiece does not allow for a flute embouchure and there is no indication from the attachment that the instrument is to be held any differently. Both designs by Wheatstone and Townley simply direct the air down rather than across the mouth hole, similar to a fipple flute. There is however no evidence to suggest that either of the attachments allow for the flute to be held in a vertical position. Both are attached to the flute headjoint in its horizontal position. Thus Fitzgibbon is inaccurate in his comparison of Wheatstone and Townley to Giorgi.

There are however, two patents which Fitzgibbon and Rockstro fail to mention, by E. Wünnenberg and by Karl Guenther both of which change the headjoint to play the flute/piccolo vertically.

In 1889, Eberhardt Wünnenberg patented an instrument, (U.K patent No.11171, German patent no.49789)¹³ in which 'the head instead of being in a line with the remainder of the instrument, is bent round at right-angles, enabling the player to hold the flute straight in front of him.'¹⁴

On the patent application Wünnenberg is listed as a musical instrument manufacturer living in Cologne. Wünnenberg writes that 'in playing large concert flutes of the usual form the player soon falls into an incorrect attitude and in the case of march or transverse flutes there is the additional inconvenience that the player must march with the face directed to the left by which he is prevented from having a free view, and from observing the route of the march.'¹⁵ Leading him to design a 'flute held directly in front of the player and...handled as easily as other wind instruments.'¹⁶

Eberhard Anton Wünnenberg Senior (b.1812 d.1877) established a workshop in Cologne c.1844 having trained with Ziegler in Vienna.¹⁷ In 1877, his son Bernhard Eberhard Junior (b.1860 d.1938)¹⁸ inherited the workshop. Since the patent is dated twelve years after the death of the senior Wünnenberg, it would appear to be the son's invention.

¹¹ R.S Rockstro: *The Flute* (London: Musica Rara, 2nd Edition 1928, Reprint 1967), p.286.

¹² *Ibid.*, p.287.

¹³ In Germany on 28 March 1889 applied, 27 November accepted, no.49789 and in the UK on 11th July 1889 applied, 17th August accepted, no.11,171.

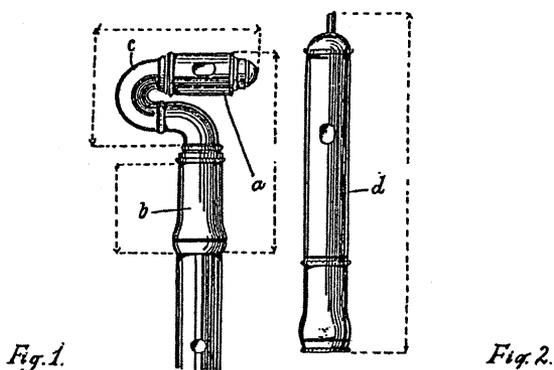
¹⁴ From the patent specification.

¹⁵ From the patent specification.

¹⁶ From the patent specification.

¹⁷ W. Waterhouse: *The New Langwill Index* (London: Bingham, 1993), p.437.

¹⁸ *Ibid.*, p.437.



Drawings from the patent by E. Wünnenberg 11th July 1889 no. 11,171

Fig.1 a, being the head, the axis of which is at right angles to that of the finger tube; b, an intermediate part in communication with head through curved neck c. Fig.2 shows the old form of head d.

An example of a piccolo made by Wünnenberg Junior survives. A ‘D’¹⁹ piccolo, it has six keys (B flat, C, G sharp, short F, long F, D sharp). It is made of African blackwood and silver. There are two headjoints. The first is in a standard shape made of ivory. The second is the patented Wünnenberg vertical headjoint in German silver with a blackwood embouchure barrel. Both are clearly shown on the photograph in the colour supplement. The ivory headjoint is marked WUNNENBERG/COLN/J.R.53. The patented headjoint is marked WUNNENBERG’S D.R.P/No.49789/PJ TONGER KOLN. The overall length is 31.6cm with the standard head and 26.5cm with the patented head. The sounding length is 28cm with the standard head and 26.5cm with the patented head.²⁰ Both headjoints sound D(2) for the fingering for D(1), i.e. a non-transposing piccolo.

On 20th January 1891 John Thomson King a patent agent, patented in the UK, no.969, the idea of a head joint for flutes, piccolos etc, for musician Frederick William Guenther from Pittsburgh in the U.S.A.

‘The head of the instrument is T shaped... the embouchure being at c opposite the body. Stoppers are fitted at the ends a and b by which the pitch can be regulated. The body has hooks, one of which is shown at 5, for the thumbs of the player, enabling the instrument to be held easily.’²¹

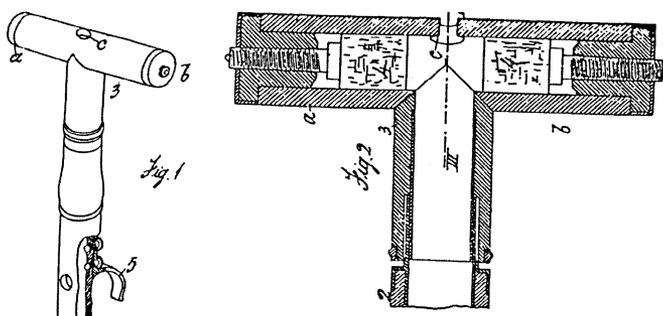
¹⁹ A ‘D’ piccolo produces D(2) with a holes covered i.e. lowest note. Although the D(1) fingering produces the octave sounding D(2), it is said to be non-transposing. It is listed as a ‘D’ instrument rather than ‘in C’ as the natural scale of the instrument from six holes to one produces the scale of D major.

²⁰ Photographs and details kindly provided by the owner. Private Collection, Germany.

²¹ From the patent specification.

In the patent specification Guenther mentions the existence of another vertical flute (possibly Wünnenberg's patent) and in comparison to his own patent is highly critical of it.

'... [A] flute has been devised in which at the end of the tube there is a U shaped head, having an end mouth hole²²... While such an instrument is, of course, easy to hold, it does not give a better musical note, and is in fact inferior in this regard to the ordinary side hole flute. It differs essentially from my flute in that the air is caused to pass indirectly from the mouth-hole to the flute tube, while in mine the mouth-hole is directly opposite the flute-tube giving a direct passage to the air... My invention... affords a flute which is easy to hold and to manipulate, which produces the notes with comparatively little effort of the player, and is much truer and more accurate in tone than any other flute known to me.'²³



Drawings from the patent by King (for Guenther) 20th July 1891 no.969

Fig.1 view of flute. Fig.2 longitudinal section of the mouth piece and part of the flute tube. 2 is the flute tube. 3 is the hollow mouth piece, T shaped, having at the end a lateral enlargement consisting of tubular portions a,b containing adjustable stoppers 4. c is the embouchure or mouth hole.

The specification drawings above however, show an odd-looking instrument with hooks for the thumb, suggestive of a clarinet-style of holding the instrument. The mouth-hole on the headjoint in the specification also appears to be quite small.

It would seem that Guenther's ideas were not popular as there is no known example of an instrument made to this specification. Guenther registered the same specifications in the U.S.A in 1891 patent no.#444830 and in Germany on the 6th November 1891, no.59465.²⁴

²² Perhaps meaning Wünnenberg.

²³ From the patent specification.

²⁴ Another German patent no.131162 25th July 1901 by Adam Rüdiger in Osnabrück shows a vertical headjoint for flute. It appears to be very similar in idea and appearance to that shown by Guenther.

These headjoints are similar to Giorgi's idea to hold a flute vertically and appear to be up to five years earlier. However, Giorgi had patented an idea for a vertical flute in Italy, no.771, around 1888. The abridgement available does not provide much information but from existing instruments it is known that he had been making a similar flute headjoint for his flutes in conjunction with Schaffner c.1888. Nevertheless Giorgi's patent is not the earliest example of a vertical headjoint. On the 31st December 1879, a little known Italian, Camillo Bergonzoni, patented (no.795) his design for a vertical flute. From the sketches supplied with the patent application, the flutes appear to have a headjoint more similar to the Wünnenberg than to Giorgi.

Giorgi's system became more well-known than the others for a variety of reasons. He travelled extensively to promote his new invention, and not only did he change the headjoint, but also created an instrument that was without keys.

He claimed that though the flute had been radically reformed by Boehm and was more scientific in its construction, the Boehm system required a mechanism that was 'delicate, expensive and not always dependable.'²⁵ He organised that his flute not only did away with the necessity for keys and thus made them more affordable, but that the eleven holes allowed for finger independence without cross-fingering in the third register which made his instrument easier to play and to learn than the Boehm system.

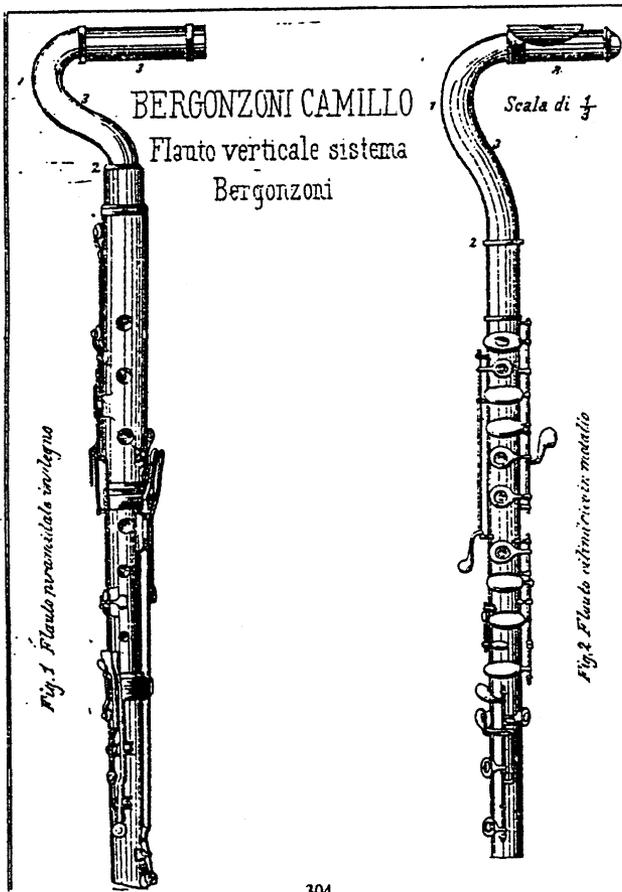
In the patent application Giorgi suggests his reason was the desire to create an instrument that did not require cross-fingerings or any keyed mechanism so there was less to go wrong:

'As a remedy to... [the] imperfections in flutes I have invented an instrument entirely conformable to the laws of acoustics possessing all the eleven holes necessary to the natural production of the chromatic scale. These are placed with mathematic exactitude and in conformity with the natural position of the fingers by which they can be closed without the necessity of keys... Thus in the diminution of mechanism the instrument becomes lighter, simpler and less expensive.'²⁶

²⁵ From the patent specification.

²⁶ From the patent specification.

L. de Lorenzo: *My Complete Story of the Flute* (USA: Texas Tech University Press, 1992), p.16. Lorenzo suggests that it was due to Giorgi's expensive flute being stolen a number of times that he decided 'to construct a flute... which could be produced so cheaply and simply as to provide little temptation to either thieves or practical jokers.'



304

Bergonzoni drawings from patent no. 795 31st December 1879

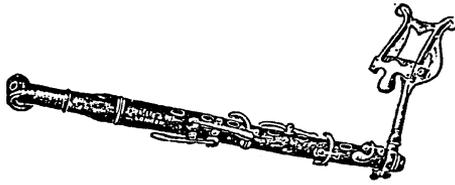
Giorgi toured with his instrument to gain support for it and ‘played... for many famous musicians, who evinced much interest at the numerous testimonials he [had] in his possession to testify.’²⁷

‘Giorgi’s really ingenious discovery consists in the form he imparts to the mouth-hole of the flute, which, being free from the tuning cork, prevents the loss of breath as the sound is coming from the instrument.’ *Committee of the Royal Conservatory of Music at Milan*

²⁷ L. de Lorenzo: *My Complete Story of the Flute* (USA: Texas Tech University Press, 1992), p.405.

'The instrument being held with the arms evenly suspended and breathed into with the straight head, does not cause the respiratory impediment which is caused by the transverse position...' *Commune of Rome Office VIII*²⁸

Giorgi toured England and soon after patenting his idea, in 1896, the firm of Joseph Wallis & Son bought the right to make the Giorgi patent flute and piccolo. In their catalogue of 1903 they show a drawing of a Giorgi style six-keyed piccolo with music stand attached to the end (see below). The catalogue details that this instrument is available as a D, E flat or F instrument for the price of £1 and 1 shilling. [i.e. a guinea].



Six-keyed Giorgi style piccolo from a 1906 catalogue of J. Wallis & Son

An example of an F piccolo²⁹ (D1 sounds F2) made by J. Wallis & Son Limited with the Giorgi head fitted, exists in the Bingham collection.³⁰ Examples of the Giorgi flute are relatively common and can be found in the Bate Collection, Oxford and the Edinburgh University Collection of Historical Musical Instruments, but a Giorgi piccolo is much rarer this being the first example found in a European collection.³¹

²⁸ Newspaper reviews taken from a 1896 brochure on Giorgi's flute. *Prof. Giorgi's Patent Flute* (London: Joseph Wallis & Son, Ltd, 1896).

²⁹ An 'F' piccolo sounds a minor third higher than a 'D' instrument and gives a natural scale (six holes to one hole covered) of F major. It can sometimes mistakenly be referred to as 'in E flat.'

³⁰ Photograph kindly supplied by Tony Bingham, London.

³¹ The Dayton C. Miller Collection in Washington also has an example of a Giorgi piccolo no.402. Laura E. Gilliam & William Lichtenwanger: *The Dayton C. Miller Flute Collection. A Checklist of the Instruments* (Washington: Library of Congress, 1961), p.29. It is a D piccolo with six-keys, a cocus body and ebonite head. The length is 26.3cm.



Pictured above, it is conically bored and made of ebonite including the mouthpiece. Ebonite seems to have been a favourite material of Giorgi since many of his surviving instruments are made from it. One reason could be that unlike wood, ebonite does not crack through temperature changes or moisture. The piccolo has six German silver keys for D sharp, G sharp, B flat, long F, short F and C. Although the instrument can produce a few notes, it does not play easily nor over the entire range. The overall length and sounding length is 22.5cm.

The pitch of the instrument suggests that it was used in a fife and drum band. In a catalogue of the firm Wallis & Sons, the formation of different bands is shown, and the 'F' piccolo only occurs in the fife and drum band, presumably as the octave match to the F flute also being used.³² The fact that it was not made in the traditional Giorgi style of having no keys perhaps reflects the reluctance of established players to change to a new system of fingering. As a compromise, the Giorgi-styled head has been added to a typical six-keyed piccolo of the day.

BAND LISTING

FIFE AND DRUM BAND

				16 Performers		21 Performers		25 Performers
F Piccolos...	...	...	...	2	...	2	...	2
B flat Flutes...	...	...	...	7	...	10	...	12
F Flutes...	...	...	...	2	...	4	...	3
Side Drums...	...	...	...	3	...	4	...	5
Bass Drums...	...	...	...	1	...	1	...	1
Triangle...	...	...	...	1	...	1	...	1
Cymbals...	...	...	...	0	...	1	...	1

³² Band listing given below.

Although reviews and letters of support accompanied its general release, enthusing support, the Giorgi system failed to catch on as quickly as the Boehm system.

'We quite believe it will supersede all other flutes in Fife and Drum Bands, and will become the most popular flute among amateurs for home use.' *The British Musician* December 1896

'The instrument is played perpendicularly, the embouchure being placed at the head of the tube. The advantage of this position must be obvious, as free play is given to the lungs, and the performer faces his music instead of looking at it with neck awry.' *Music* December 1896³³

It was suggested that the cheap cost of the instrument was a reason for its lack of success. 'One of its greatest advantages... but which proved one of the main causes of failure, was its small cost, which would have brought it within the reach of everyone.'³⁴ Players were not convinced to change to yet another system despite enthusiastic reports and testimonials. Also contributing to its demise was the death of the manager of Wallis & Son soon after taking on the patent and 'the flute was put aside'³⁵ by the firm eventually fading into oblivion.

Giorgi lived long enough to see his invention fade but Lorenzo says 'Giorgi related his story with much good nature and added that the failure of his flute had not broken his heart as some might have thought.'³⁶ Perhaps that was because it was 'through this same flute that Giorgi indirectly amassed a fortune.'³⁷ Whilst touring New York City he met the manager of a plumbing company who was 'interested in flute playing and had attended his recital.'³⁸ Giorgi arranged to head a firm of plumbing selling American pipes in Italy and became a millionaire. He died on the 28th November 1953 aged ninety-seven years.

CONCLUSIONS

Many texts suggest Giorgi as the pioneer for a vertical headjoint for the piccolo and flute. Contrary to this idea are the patent specifications by little known Camillo Bergonzoni, clearly showing a vertical flute. These patent drawings date from 1879 over ten years earlier than Giorgi. The text by Fitzgibbon credits the vertical headjoint to the makers Townley and Wheatstone. However, the patent drawings show that while they are

³³ Reviews taken from a 1896 brochure on Giorgi's flute. *Prof. Giorgi's Patent Flute* (London: Joseph Wallis & Son, Ltd, 1896).

³⁴ L. de Lorenzo: *My Complete Story of the Flute* (USA: Texas Tech University Press, 1992), p.405.

³⁵ *Ibid.*, p.405.

³⁶ *Ibid.*, p.406.

³⁷ *Ibid.*, p.405.

³⁸ *Ibid.*, p.405.

headjoint attachments, they are closer to a whistle than a flute embouchure. Makers, Wunnenberg and King patented the application of a vertical headjoint to a piccolo as well as a flute. Wunnenberg produced at least one known example of his headjoint for a piccolo. While Giorgi was the most well-known exponent, vertical piccolos and flutes did not achieve the level of success suggested by the initial press reviews.



Plate 6. *Vertical Piccolo of African blackwood and silver by Berhard Eberhard Wunnenberg Junior. Upper left: close-up of maker's name; Upper and lower right: front and rear of the complete instrument; Lower left: the patented Wunnenberg vertical headjoint in German silver with a blackwood embouchure barrel. See article by Danielle Eden – 'The Vertical Piccolo'. Photos by permission of the owner.*